Michigan Senate
Energy & Technology Committee

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Renewable Hydroelectric Power

Bellevue Mill Hydro and Elk Rapids Hydro

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Hydroelectric Power –
the Power of Moving Water

- Domestic & Secure – water supply is not subject to disruption of foreign suppliers, cost & economics, or fuel transportation
- Renewable – sustainable, not depleted, natural energy in falling water
- Efficient – 85-90% overall (fossil fuel is ~40%)
- Clean – no pollution or toxic byproducts of any sort

Hydro Facts - USA

- Hydro accounts for 7% of the country's total electricity (1.3% of Michigan's)
- Hydro accounts for 58% of the country's renewable energy (28% of Michigan's)
- **Only 3% of the nation's and Michigan's currently existing dams produce power**

Hydro Facts - Michigan

- **There are about 2500 dams in the state**
- Currently about 330 MW from 80 operating hydros in the state
- 55 retired hydro sites - worth about 30 MW
- About 750 dams that could produce 20 – 200 kW each - worth up to 50 MW
- Many fast moving streams at 1 – 10 kW
- 1998 Idaho National Laboratory study: 350 MW potential
- 2006 DOE, EERE report estimates 133 MW potential
- **Total additional potential of between 100 and 350 MW (500,000 – 1,800,000 MWhr)**

Hydro Facts - Michigan

- **200 MW of new hydro potential in the state is equivalent to:**
  - **a small coal plant**
  - **About 250 1.5 MW wind turbines**
  - **3 or 4 average size wind farms (at 100 MW each)**
- Downside:
  - FERC licensing with required fish, wildlife, and plant surveys, various studies and potential mitigation efforts could increase rehab expenses by 50% - 300% - efforts to improve this situation have been started this past year
  - This is a burden that solar, wind, and biomass do not have

Bellevue Mill – built 1854 – shut down 1955
Shown here in 1975 - reason to have hydro

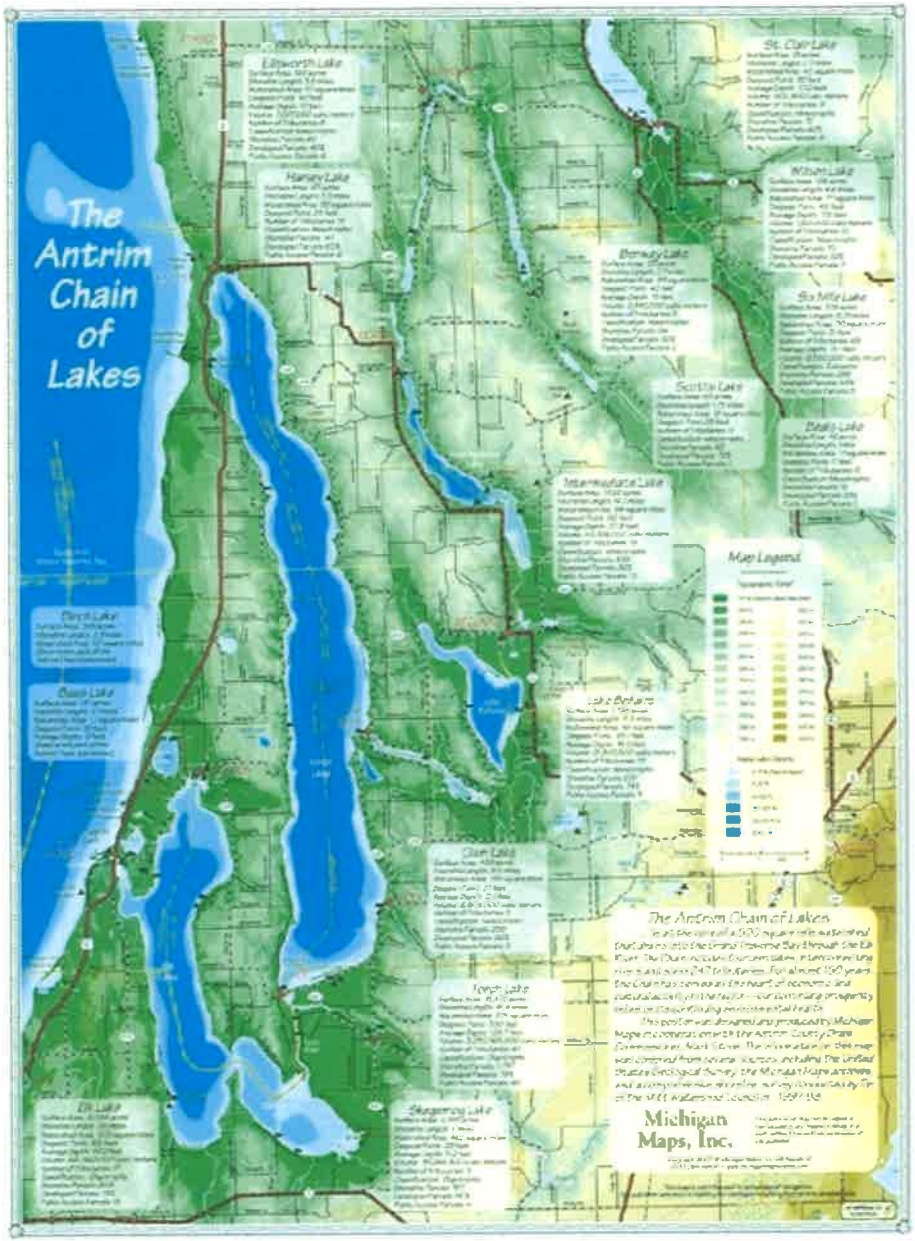
Bellevue Mill – restoration started 1977, ongoing

Bellevue Mill – 45kW – electricity for 20 to 50 homes

Elk Rapids Hydro, built 1916
generators decommissioned 1965
shown here in1984
note broken windows and run down condition
- reason to have hydro

Elk Rapids Hydro – 2013
700kW, electricity for 400 to 700 homes

Hydro Powerhouse, Elk River, Grand Traverse Bay, Marinas today



The Elk Rapids Hydro dam blocks the migration of dozens of invasives from Lake Michigan up into the pristine Antrim County Chain of Lakes and controls the court mandated level of Elk/Skegemog Lakes

Major Event in Elk Rapids:

Stockhausens taking over operation – August 29, 2007

With County, Village, Chamber of Commerce officials

Other Hydroelectric Benefits:

- Is "Baseload" Power – continuous, steady, reliable
- Has "Black Start" Capability
- Has high capacity factors – generally 60% - 70%
- Impoundments provide wildlife habitat for fish, waterfowl
- Impoundments and lakes provide recreation for fishers, boaters, swimmers, picnic areas, etc
- Provides distributed generation all around the state
- Has 100+ year life span compared to 30 for fossil fuel/nuclear plants
- Revenue provides for maintenance and upkeep of its dam and generating structures, etc.
- Employs operators, skilled trades, suppliers and services
- Pays taxes, licensing fees
- Provides flood control, lake level control
- Block upstream migration of invasive species

Hydroelectric - Goals:

- There are about 80 hydro plants in the state, with 19 being small independent hydros interconnected with Consumers Energy.
- Virtually all 19 have contracts that end in the next several years.
- Renewal of existing contracts that provide for certainty and viability (now at ~$80/MWhr) are in question.
- Wholesale spot market pricing (~ $35/MWhr) will drive many/all out of business.
- To keep these small independent hydros viable, either:
  - these contracts need to be renewed, or
  - alternate electric customer sales opportunities are required, or
  - a "Standard Offer" (~ $80/MWhr) needs to be worked out.

White's Bridge Hydro – Victor Leabu